

Malheur National Wildlife Refuge
Burns, Oregon

Narrative Report for Period September 1 to December 31, 1959

Roster of Regular Personnel

John C. Scharff.	Refuge Manager
David B. Marshall.	Wildlife Management Biologist
Leon A. Littlefield, Jr.	Refuge Manager
Noel L. Cagle.	Foreman, Construction & Maint. III
Marselle Leake	Shop Foreman II
Eugene E. Storm.	Mechanic, Heavy Duty
LeRoy J. Wilson.	Operator, Dragline
Eugene P. Heath, Jr.	Refuge Clerk
Alfred S. Ludi.	Building Repairman
Quentin L. Currey.	Maintenanceman
Thomas B. Davies	Maintenanceman
Judd A. Wise	Maintenanceman
Ivan J. Carey.	Clerk-Typist

Temporary Personnel

Elmer T. Ash	Operator, Dragline
John B. Caviness	Oiler
Paul G. DuMont	Laborer
Lawrence W. Haug	Laborer
Marvin R. Kaschke.	Student Trainee (Biology)
William C. Kindall	Oiler
Norbert J. Schekall.	Laborer
Jack M. Slates	Operator General (light)
Melvorn Slates	Laborer
Vernon Vaughn.	Laborer
George J. Velins	Operator General (light)

Refuge Manager, Malheur Refuge,
Burns, Oregon

February 9, 1960

Regional Refuge Supervisor, Portland, Oregon

September-December 1959 Narrative Report
Malheur Refuge

(1-R)

At first reading your subject report is of excellent quality. It carries a wealth of information that will be of value in connection with the operations of the refuge at present and in the future.

The section on weather conditions was very good in showing the comparison over the years. The drought conditions that prevailed last year may well have been a blessing in disguise. Observations made last fall and those to be made this spring will undoubtedly disclose information of value to waterfowl management. The records point strongly to the habitat required if we are to maintain the normal segment of the Canvasback population. Too, it will point to the habitat that is required for the Ruddys and the Gadwalls.

The graph showing the seasonal and use-day distribution by units adds considerable value to the report. The section of Physical Development indicates that considerable attention was given to buildings and general improvement of the facilities. It is considered important that this be assigned proper priority in order that the physical condition and the appearance of buildings and structures be maintained at a level expected of a Federal agency.

On page 9 referring to the loss of the old P-Ranch dwelling indicates that this occurred in 1941. It is believed that this was 1951. Your copy of the report should be corrected.

The section on weed control was particularly good and carries information that will be of interest and value for future use.

It was interesting to note the results of the experimental grazing on Knox's field. This experiment should be continued toward developing a grazing plan that will best serve the needs of waterfowl and at the same time disrupt as little as possible the local grazing economy.

Original Signed by
Kenneth T. MacDonald

KFMacDonald:mjs

Narrative
(Please attach in
acc. folder on top of
narrative material)

Table of Contents

I	GENERAL	
	Weather Conditions.	1
	Habitat Conditions.	2
II	WILDLIFE	
	Migratory Birds	4
	Upland Game Birds	7
	Big Game Animals.	7
	Fur Animals, Predators, Rodents, and other Mammals.	7
	Hawks, Eagles, Owls, Crows, Ravens, and Magpies	7
	Other Birds	7
	Fish.	7
	Disease	8
III	REFUGE DEVELOPMENT AND MAINTENANCE	
	Physical Development.	8
	Plantings	12
	Collections and Receipts.	13
	Control of Vegetation	13
	Fires	15
IV	RESOURCE MANAGEMENT	
	Grazing	15
	Haying.	15
	Fur Harvest	16
V	FIELD INVESTIGATION OR APPLIED RESEARCH	
	Progress Report	16
VI	PUBLIC RELATIONS	
	Recreational Uses	16
	Refuge Visitors	17
	Refuge Participation.	18
	Hunting	19
	Violations.	20
VII	OTHER ITEMS	
	Items of Interest	20
	Photographs	23
	Signature	23
	Waterfowl Use Graphs - following page indicated	6
	NR Forms - following page indicated	34

Malheur National Wildlife Refuge
Third Period Narrative Report
September 1 to December 31, 1959

I. GENERAL

A. Weather Conditions.

Headquarters Station

	<u>Snowfall</u>	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
		<u>This Month</u>	<u>Normal</u>		
September		1.72	.54	90	24
October		.84	.90	77	19
November	0.1	T	.82	65	7
December	<u>5.1</u>	<u>.38</u>	<u>.89</u>	<u>50</u>	<u>3</u>
Totals	5.2	2.94	3.15	Extremes 90	3

P-Ranch Station

	<u>Snowfall</u>	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
		<u>This Month</u>	<u>Normal</u>		
September	T	1.61	.52	91	25
October		.78	1.14	85	15
November	T	T	1.02	71	6
December	<u>4.0</u>	<u>.46</u>	<u>1.22</u>	<u>61</u>	<u>2</u>
Totals	4.0	2.85	3.90	Extremes 91	2

Double-O Ranch Station

	<u>Snowfall</u>	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
		<u>This Month</u>	<u>Normal</u>		
September		.66	.28	85	22
October		.77	.54	78	24
November		T	.79	66	8
December	<u>1.5</u>	<u>.19</u>	<u>.96</u>	<u>60</u>	<u>1</u>
Totals	1.5	1.62	2.57	Extremes 85	1

Buena Vista Station

	<u>Snowfall</u>	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
		<u>This Month</u>	<u>Normal</u>		
September		.94	.65	—	—
October		.69	.94	—	—
November		T	.38	—	—
December	<u>1.5</u>	<u>.57</u>	<u>.41</u>	—	—
Totals	1.5	2.20	2.38	Extremes —	—

Normal precipitation is based on a ten-year average at the Double-O Station, a fourteen-year average at the P-Ranch Station, a twenty-three-year average at Headquarters Station, and a three-year

average at the Buena Vista Station.

This last November was the driest November since 1939 when there was also only a trace of moisture.

The general rains in September and October caused the surrounding country to green up considerably; however, a very dry and cool November and December caused a setback. The first general snow for this area occurred on December 12 putting down three inches at headquarters, two inches at Buena Vista, and one inch at the P-Ranch. The three inches of snow put down at headquarters contained .18 inches of moisture.

B. Habitat Conditions.

1. Water. In general, the poorest water conditions in 25 years were experienced this period. The water level of Malheur Lake stood at an elevation of about 4090.88 at the beginning of the period, raised to 4091.00 in October, and dropped to 4090.82 in November. Actual surface acres were thus less than half what they were for the same period a year ago. The entire west side of Malheur Lake went dry and all but about 500 acres on the east side dried up this period.

Unlike Malheur, there was an excellent water carry-over in Harney Lake from last year. We do not have any actual figures for Harney Lake, but it was readily apparent this lake did not suffer near the loss in either levels or surface acreage as Malheur. We assume the water loss in Harney was less than Malheur due to the lack of plant life in Harney as opposed to a high rate of plant transpiration on Malheur.

Considerably less water was also present in the Blitzen Valley than for the same period last year. Boca Lake dried up during the period after the outlet was opened. It is proposed for farming operations this coming spring as a part of our pond rotation plan. The Besnon Pond was kept dry for part of the period because of canal cleaning activities. The only major areas containing water in the Blitzen Valley this period were Knox Ponds, part of Knox Field, and part of Unit 8 Duck Pond Field.

Stream flows were below normal with the Silvies River and Silver Creek dry and the Blitzen River flow down considerably.

Unless above normal precipitation is experienced the remainder of the winter, we can expect another short water year. In fact, if the present trend continues, Malheur Lake will be nearly dry by next fall.

By December 5, all water areas except those which are spring fed and about 50 per cent of Harney Lake were frozen

over. By December 12, Harney Lake became frozen over. Spring fed areas which froze over include Krumbo Lake which became frozen about December 30.

2. Food and Cover. As was covered in the last narrative, food production for waterfowl on the refuge was exceedingly poor this year. Waterfowl use of the refuge was a reflection of available food, most of which came from Malheur Lake, grain fields north of Malheur Lake, and Harney Lake. We experienced the unexpected in finding heavy use made of a stand of coontail (Ceratophyllum demersum) within the northeast portion of the hardstem bulrush (Scirpus acutus) stand in the center portion of Malheur Lake. This coontail put on an excellent fall growth whereas the water-milfoil (Myriophyllum) reported on from the same area in our last report died down. Use of the coontail area was of sufficient importance that it was deemed advisable to collect some waterfowl from the area to definitely prove or disprove that the birds using the area were actually taking coontail. Accordingly on November 3, 6 gadwalls, 2 widgeon, and 5 coots were taken from this area. Their digestive tracts contained green leaves and stems of this plant along with small quantities of hardstem bulrush achenes, which may have been retained for grit. These birds were in excellent condition and carried an abundance of fat.

Although some grain was grown on the refuge, most of it failed and its importance was small in the over-all picture. Grain on private land north of Malheur Lake, much of which was not harvested because of its near failure as a crop, was heavily used by the grain-eating species using Malheur Lake.

Good food conditions for waterfowl were experienced on summer grazed areas in the Knox Field and Pond area in the Blitzen Valley. However, this area is quite small in the over-all picture.

Little is known about food production on Harney Lake, but it is assumed animal matter played an important role. Food production here must have been considerable as evidenced by waterfowl use.

Food for fish-eating birds was in abundance and readily available because of a concentration of fish created by receding water levels. The existence of vast mud flats, some of which were constantly being reflooded with a skiff of water, also made ideal conditions for shorebirds.

The drouth conditions and consequent poor growth of upland plants has caused a shortage of upland game bird food.

II. WILDLIFE

A. Migratory Birds.

1. Waterfowl. Waterfowl use continues to show major changes, but the change for the period this year compared to 1958 was not as great as the use change noted between 1957 and 1958. Table 1 shows how swan use has declined for three years in a row, how goose use has done likewise, how duck use dropped way below 1957 in 1958 but rose slightly this year, and how coot use has remained similar.

Table 1. Comparison of Waterfowl Use Days and Peak Populations for the September-December Period.

	<u>Use Days</u>		
	1957	1958	1959
Swans	730,000	88,000	37,000
Geese	1,600,000	1,170,000	771,000
Ducks	31,600,000	8,600,000	10,436,000
Coots	6,873,000	9,800,000	8,953,000

	<u>Peak Populations</u>		
	1957	1958	1959
Swans	18,000	1,600	700
Geese	27,500	37,000	13,400
Ducks	618,000	154,000	182,400
Coots	158,000	150,000	205,000

Table 2 shows much the same trend experienced in the past several years with by far most of the refuge waterfowl use occurring on Malheur and Harney Lakes.

Table 2. Distribution of Swan, Goose, Duck, and Coot Use Days During the September-December, 1959, Period.

<u>Refuge Area</u>	<u>Swans</u>	<u>Geese</u>	<u>Ducks</u>	<u>Coots</u>
Double-O	6%	14%	5%	3%
Harney Lake	8%	8%	27%	4%
Malheur Lake	79%	52%	60%	92%
Blitzen Valley	7%	26%	8%	1%

The abundance and relative use of various parts of the refuge by species follows.

Whistling Swan. Compared to the presence of an estimated 18,000 of these birds in 1957, there was a peak of only 700 this year. This drop is mainly a reflection of the abundance of sago pondweed (*Potamogeton pectinatus*) in 1957 as opposed to none this year. Most of the swans found this year were present in the small area which remained flooded on the east side of Malheur Lake. It is assumed they were digging sago pondweed tubers which represented growth from previous years.

Trumpeter Swan. Presently accounted for are 21 trumpeter swans compared to 25 at this time a year ago and 35 two years ago. During the early part of the period, we could account for only 15; but during freeze-ups at the end of the period up to 21 were seen at one time at the Sod House Spring.

Before the freeze-up, trumpeter swans were seen at a number of locations on the refuge including Harney and Malheur Lakes, the Double-O area, and the Blitzen Valley. The pond lying beside Highway 205 in Administrative Unit 8 was regularly frequented by up to six trumpeters until freeze-up.

No transplantings of trumpeters were made this year due to poor reproduction at Red Rock Lakes and poor food and water conditions here.

Canada Goose. Numbers of this species were much like last year; and, as in the past, honkers remained well distributed over the entire refuge until late in December when there was a general over-all reduction. This species is to a large measure a meadow grazer in this area and is thus not affected by the drastic changes in food conditions experienced for other waterfowl species. Small flocks of cackling geese were occasionally seen in the Boca Lake area and on the north side of Malheur Lake.

Snow and White-fronted Geese. Much greater than normal numbers of white-fronted geese were seen, while snow goose use was the lowest for this period in several years. These geese rested on the north side of Malheur Lake and fed in grain fields on the Island Ranch and vicinity. A few snow geese on occasion also flew to the Mud Lake area to feed and were seen on Harney Lake.

Puddle Ducks. Although over-all duck use was similar to last year, there was considerable variance between this and last year by species. Mallard, pintail, and shoveler numbers were way below last year while the gadwall, the most predominating duck species this year, saw a tenfold increase in use days. Widgeon numbers were the same as last year. Mallards, pintails, widgeon, and shovelers used nearly all parts of the refuge; but Harney Lake was more favored by pintails and less favored by mallards. Mallards and pintails which frequented Malheur Lake flew to grain fields north of Malheur Lake in the vicinity of the Island Ranch to feed. Small numbers also moved between

Malheur Lake and grain in the Sod House vicinity to feed. Included in this category was the small refuge rye field at Sod House Dam which also received use by Canada geese and sandhill cranes. Mallards and pintails which moved between Malheur Lake and nearby grain fields were to some degree accompanied by widgeon. Other widgeon remained on Malheur Lake to feed on coontail with the great numbers of gadwalls and coots. Nearly all of the gadwall use for the period took place on Malheur Lake. Green-winged teal were to be seen at nearly every location.

A male European widgeon was seen and photographed at the Sod House Spring on December 15.

Diving Ducks. Two years ago for this period at the height of sago pondweed production, we reported a canvasback peak estimated at 150,000. This year, we could find no more than 600 cans at one time. Redhead use was only 11 per cent of that found four years ago. This species has shown a steady decline. On the brighter side, was the phenomenal use of Harney Lake by ruddy ducks this fall. At the peak, it was estimated 50,000 ruddies were present on Harney. This is many times more ruddies than we have seen in a long time. Considerable use of Harney was also seen by scaups.

2. Other Waterbirds. The poor grain crop experienced in the Buena Vista area resulted in a corresponding poor showing of sandhill cranes this period. The cranes for the most part used other areas instead, including the Malheur Lake and Sod House area, but their numbers were down somewhat from a year ago.

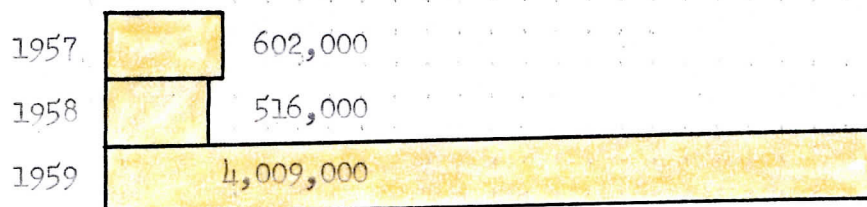
Fish-eating species fared exceptionally well and were consequently present in spectacular numbers. Heading the list were white pelicans on Malheur Lake which, in our opinion, were 30,000 strong in September. By October 14, their numbers had dwindled to an estimated 7,000, and by October 26 to 2,000. Sizeable numbers of egrets and herons also took advantage of the abundance of fish and fed in numbers on drying Boca Lake and other water areas. Little grebe use took place except on Harney Lake.

3. Shorebirds. The abundance of shorebird habitat was previously reported on. Our estimates of shorebird numbers are admittedly rough, but we estimate close to 100,000 shorebirds of all types were present on Malheur Lake in early September. Species which were seen in one day's trip by airboat on the lake on September 6 included the following: semipalmated plover, killdeer, American golden plover, common snipe, greater yellowlegs, lesser yellowlegs, pectoral sandpiper, Baird's sandpiper, least sandpiper, dowitcher, Western sandpiper, sanderling, marbled godwit, American avocet, and Northern phalarope. Such a list should be impressive to any shorebird observer. The above represents first

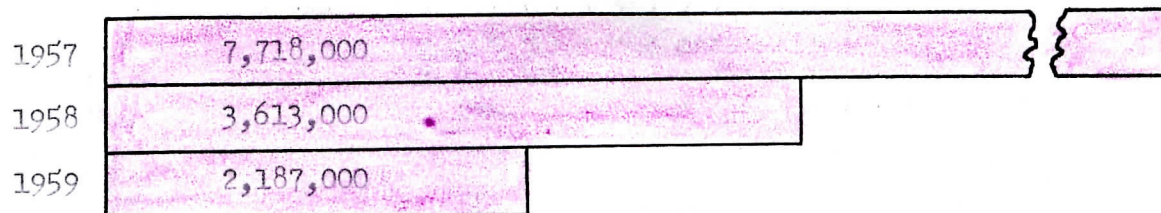
COMPARISON IN USE DAYS FOR FALL MIGRATION FROM 1957 THROUGH 1959 FOR FIVE DUCK SPECIES ON THE MALHEUR REFUGE. The wide yearly variations to which Malheur duck populations are subject to because of constantly changing food and water conditions are here illustrated.



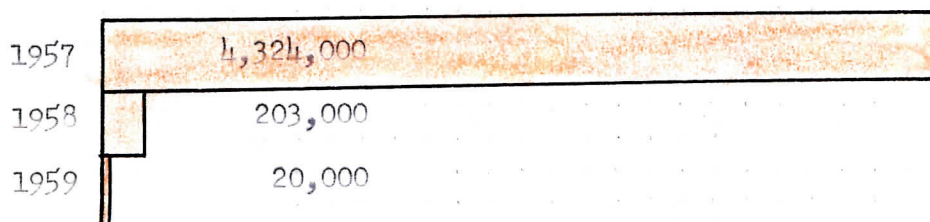
MALLARD



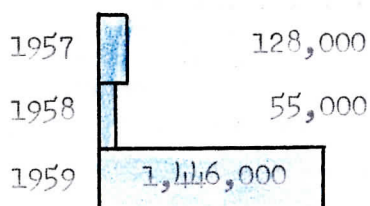
GADWALL



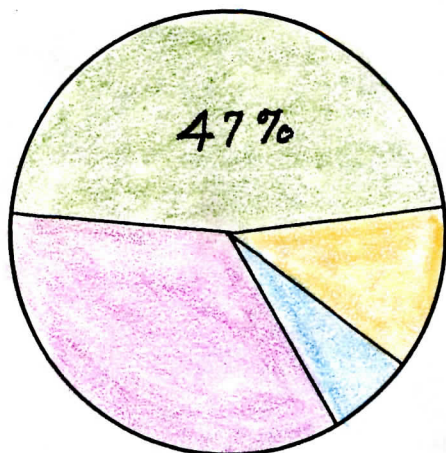
PINTAIL



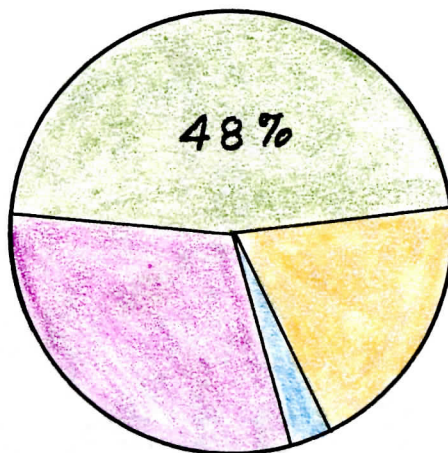
CANVASBACK



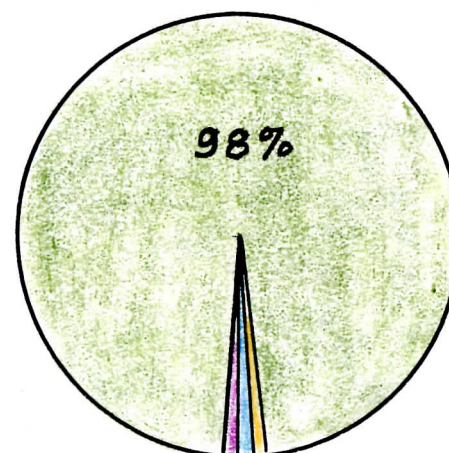
RUDDY DUCK



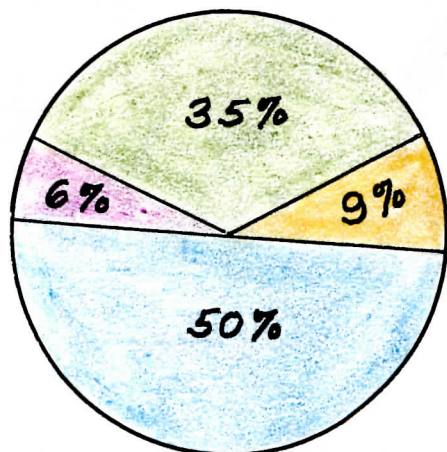
CANADA GOOSE



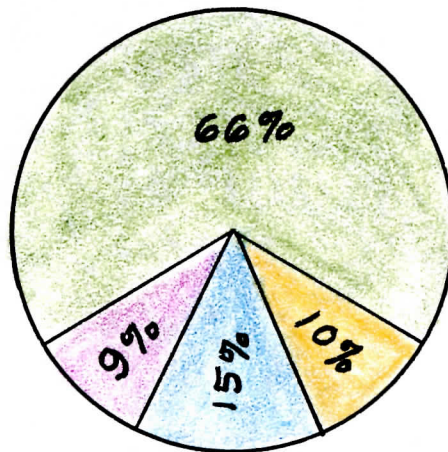
MALLARD



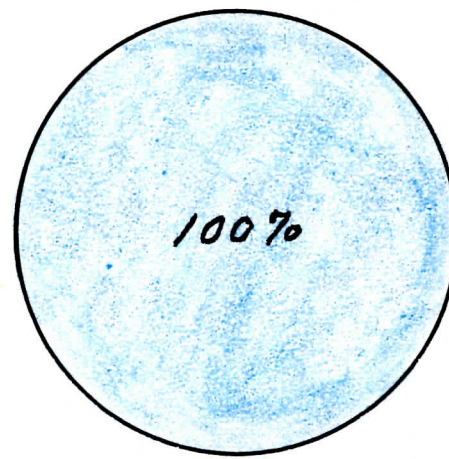
GADWALL



PINTAIL



A. WIDGEON



RUDDY DUCK

USE DAY DISTRIBUTION }
FALL MIGRATION-1959 }

DOUBLE O

HARNEY LAKE

MALHEUR LAKE

BLITZEN VAL.

fall records on Malheur for the sanderling and semipalmated plover. Surprisingly little use by shorebirds took place on Harney Lake.

4. Mourning Doves. Numbers of doves and their migrational pattern seemed like other years. ?
- B. Upland Game Birds. Numbers of all upland game birds are down considerably. This is believed to be a result of poor food conditions. No trapping of California quail will occur this year on the refuge because of this condition.
- C. Big Game Animals. For the third year in a row, mule deer use of the refuge has shown a drop. Numbers of pronghorns have dropped off to about half those found previous years.
- D. Fur Animals, Predators, Rodents, and other Mammals. Our last report told of the die off of rodents and rabbits. By October, muskrat numbers on Malheur Lake had reached near zero. A total of two active houses on the lake are all that were noted on an airboat trip in the bulrush zone in the lake's center on November 2. Through the use of poison bait, starvation, disease or a combination of these, coyote numbers dropped way off by late December. Above normal numbers of raccoons are in evidence, however. *bobcats?*
- E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies. Rough-legged hawks are scarce on the refuge this winter. Some years, over a hundred can be seen in a day's drive through the Blitzen Valley, but this year, one would be lucking in seeing six. The absence of rodents is believed to be the deciding factor in the hawk decline. This same factor is also believed to have affected the condition and number of great horned owls. We have reported on numbers of bald eagles on the NR forms, as requested. Most of these birds were seen on Malheur Lake during aerial waterfowl censuses.
- F. Other Birds. Prolonged freezing weather during December saw numbers and species of song birds decline. The annual Christmas Bird Count conducted in the south part of the Blitzen Valley resulted in a total of 37 species and 1,285 individuals seen as opposed to 53 species and over 5,000 individuals in 1958.
- G. Fish. It is believed carp numbers on Malheur Lake have been greatly reduced. Carp were not nearly as conspicuous this period as last period. This may be because of reduced activity at the surface, but, nevertheless, fish-eating birds took a tremendous toll of carp. Our earlier estimate that a white pelican can eat two pounds of carp per day was borne out when a captured pelican disgorged more than this amount. When one figures the pelican use days on Malheur Lake for the past summer and fall and multiplies it by two, we come up with over 5 million pounds of carp taken. In addition, great quantities were also taken by herons and egrets. Carp were also noted floating dead on the surface from an unknown cause during an aerial waterfowl *good*

count on September 12.

September 30 ended the first trout season (91 days) on Krumbo Lake. An estimated 1,100 anglers took 4,500 fish and angled an average of 3.8 hrs./angler catching an average of about 1.3 fish/hr. When planted, these fish were from 5 to 7 inches. On opening day, the catch averaged from 7 to 10 inches; and by the last weekend, fish up to 15½ inches were caught, with the average about 14 inches. All fish were deep bodied and in excellent condition. The fighting qualities of this Williamson Lake strain of rainbow trout are on a par with the Kamloops strain of rainbow which is known for its spectacular leaps and stamina.

On November 4, 12,100 Williamson strain of rainbow trout were liberated in Krumbo. These fish were received from Hagerman Hatchery. Lake elevation at the time was 4,196 feet (19 feet deep).

The State of Oregon liberated 15,497 fish in the area this year, 7,497 rainbow 7 to 9 inches long in Fish Lake, and 8,000 rainbow the same length in the Blitzen River.

The Blitzen River produced good catches of hatchery trout this year with some good sized "native" rainbow interspersed in the bags.

- I. Disease. Botulism losses were insignificant. The greatest number of dead ducks seen in one day was only three on September 2. No other disease losses were noted except for a trumpeter swan which was observed sick one day and found dead the following day with a bobcat feeding upon the carcass. This bird, when examined throughout, was in seemingly good condition.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

1. In addition to the usual trouble shooting at all stations on minor repairs to equipment such as stoves, hot water heaters, furnaces, refrigerators, etc., quite a number of major jobs over the refuge were accomplished.

The bunkhouse at the P-Ranch was moved to a new location, placed on a good cement foundation, a good stove installed, and a sink with cupboards installed as well as making cupboards and other inside improvements. A new shingle roof was provided and new siding replaced on one side. The roof was stained and a priming coat given the outside before adverse weather set in.

A new front porch was provided for the P-Ranch dwelling. This porch has a cement floor. All woodwork was given a primer coat of paint.

An electric fan and outside vent was provided for the bathroom at the P-Ranch dwelling.

The oil house at the P-Ranch was moved to a new site, placed on a cement floor, and proper ventilation and drain provided to comply with safety standards.

A new pressure tank was installed at the P-Ranch replacing the one which had been in use since 1938.

Nine old trees were felled and cleaned up at the P-Ranch. These trees were pronounced as being unsafe because of dead wood. Some of them had been previously damaged from the fire which destroyed the old P-Ranch dwelling in 1941. The original trees planted in this site were brought in by freight team from Red Bluff, California, in 1876. The trees about the Sod House Ranch, which are in an excellent state of preservation, were sprouts removed from the P-Ranch trees and planted at Sod House in 1888 by Emanuel Clark. Aug 3,
1947

A time switch was installed on the water pump at the refuge headquarters.

An oil drain pan was provided at the Buena Vista oil house. A new oil house properly ventilated is a must at the Buena Vista Station. The present one is too small and doesn't meet the safety requirements.

At the Buena Vista Station, an electric meter and switch was provided for the carpenter shop building and a proper weather-proof switch and hookup provided for trailer parking well away from any of the permanent buildings.

The much-needed Buena Vista barn was started with all the posts, joists, and floor of hayloft in place by the end of the period. Posts for the corral and gates were substantially in place also.

In the carpenter shop, a new jointer bench was provided. One 16-foot ladder was made, a tool chest provided for use in carrying tools out on projects, four stands made for fuel oil tanks to properly mount new fuel tanks at residences where mostly old barrel tanks are in use, and benches made for the P-Ranch bunkhouse. One new fuel oil tank was installed at the Witzel Patrol Station set on a new base and stand.

2. Restoration of Dikes, Roads, Bridges, Structures, and other Improvements. Work in this category consisted of cleaning approximately 12 miles of boundary fence right of way in such a fashion that patrol and maintenance work may be performed for quite a number of years.

A livestock water hole was cleaned and enlarged at the flowing well in the Swan Lake Field and another water hole rebuilt in the Rock Island Field of the Double-O Unit.

Some of the old dikes in the Swan Lake Field on the north side of Malheur Lake were rebuilt with more width to accommodate vehicle travel and two 24-inch drainage pipes were installed. With the acquisition of Tract 55, this improvement will allow access from the checking station to the eastern portion of the public shooting area as well as administrative access without traveling a much longer distance outside the refuge and re-entering through private property.

The old buildings and corrals about the public hunting area checking station were bunched and piled in readiness for burning. Anything of a salvageable nature was removed a number of years ago.

Twenty-eight miles of roads and motor trails were bladed in the Double-O and Blitzen Valley Units. Owing to the continued dry weather, very little could be done in the way of road improvement on surfaced roads.

A number of levees were repaired on the Double-O Unit and two 18-inch pipes and one 24-inch pipe with headgates were installed to facilitate the water distribution.

A mile and a half of the East Side Canal at the P-Ranch was cleaned and dead willows removed from the banks which had been killed by spraying two years previously.

Laterals were cleaned in the Kado Field near the mouth of the Blitzen River, the air-thrust boat landing graveled and levee repaired and graded for good vehicle access to the boat landing.

Surfacing about Refuge Headquarters Station was strengthened where required and the loading ramp and immediate vicinity given a good coat of gravel to facilitate loading under any conditions, the watering troughs in Swan Lake Field filled about and graveled to improve livestock watering conditions, a stock pile of cement gravel hauled to the refuge headquarters from the P-Ranch, and a barn site leveled at Buena Vista. Rock was hauled to fill in sewer disposal fields at refuge headquarters, Quarters 16, and two Rome dwellings located near refuge headquarters.

The rock pit on the south side of Rattlesnake Butte was thoroughly ripped to facilitate the loading of road surfacing material.

In addition to the above, many small jobs were accomplished such as hauling shale and field stone in small quantities for shoulder repair of roads and to divert streams from washing banks and damaging structures.

At the P-Ranch, a mile of new interior fence was constructed on the east side of the South Meadow Field. The old fence was

salvaged and much of the materials used. This fence paralleled the river and had been rendered ineffective by undermining of the river bank in some places and sedimentary deposits in others. Permittee labor under supervision of refuge Maintenceman Davies accomplished the work.

The fences and telephone line burned by the Buena Vista fire in November have been substantially replaced with the exception of the fence on the west side of the Huffman Field; and, inasmuch as this fence location will of necessity require changing as a result of the Diamond Drain construction, the wire was rolled up and remaining posts pulled and salvaged. Some work yet remains to be done on the telephone line; and all of the stays have not as yet been replaced; but these jobs will be done as soon as the weather permits.

3. Additional Marsh Development. The West Swamp project was completed where 26,696 cubic yards of earth were handled in the diking system, three 24-inch pipes installed with splashboard type headgates, and one 24-inch inlet pipe from the West Side Canal with sliding headgate.

One hundred eighty-seven cubic yards of gravel were hauled on the dike of the Refuge Headquarters Display Pool. Willows were pulled with tractor from the right of way of Diamond Swamp Drain. The American dragline received from surplus the latter part of November was moved to the south end of the project but little progress was made as an early freeze down was experienced and the water from McCoy Creek caused considerable overflowing. Later, this machine was moved to the center of the project where dry ground was available for working but it was shut down pending repairs awaiting parts which are on order. The Koehring dragline was moved from the Knox Swamp job and started on the north end of the Diamond project.

4. Repairs to Equipment. Five 5,000-mile checks were made; two new Dodge pickups were serviced, decals put on doors, step bumper trailer hitches were installed, snow tires put on rear wheels, and steel bed plates put in the bed of each pickup.

A new clutch, back plate, and shifting brake were installed on the TD-18A.

New king pins, shock absorbers, and wheel bearings were installed on a Ford pickup.

The tandem drive assembly was removed from our Adams grader; five transmission gears replaced; seat cushion, frame, and back installed; and the under grader reassembled.

A dump truck was painted.

Two new bearings were installed in the swing shaft on the American dragline. Cable boom guards and exhaust pipe extensions were fabricated and installed on this machine.

A heater was installed in International stake truck Tag No. I-49843.

A tire demounting stand was purchased and installed in the repair shop. A tool board was also installed in the repair shop.

A new drive chain assembly was installed in our Cat 212 motor grader.

Routine brake jobs; shock absorber, spring, and door glass replacement; servicing; tire repairing; and general equipment upkeeping operations were performed throughout the period.

Considerable time was spent of fire-fighting activities this period.

B. Plantings.

4. Cultivated Crops. Generally, the grain crops failed for lack of timely rainfall and irrigation, but some little grain of a shriveled nature was produced which furnished some feed for the fall migration of waterfowl. Suicide Field in the Buena Vista area furnished considerable use, especially for the sandhill crane; and there were small patches in the more favored spots of most plantings which provided, particularly, some use while the grain was yet in the dough stage. The share crop area on the Double-0 Unit was summer-fallowed, and approximately 100 acres seeded during the late fall with winter rye. The share crop grain in Mud Lake didn't yield anything of a harvestable nature, but did afford considerable use for migrating waterfowl during the fall season. Probably, most of the farming areas contributed some use in the way of green feed after the early fall rains in September.

Twenty-seven acres of Ladak and Rizoma alfalfa was planted during the May-August period which inadvertently wasn't reported in the last narrative. Owing to lack of rainfall and irrigation water from a gravity source, it was necessary to irrigate this seed up by pump irrigation which was quite a laborious task; but a good stand resulted over at least 90% of the planting; and the September and October rains started the rest in good shape; but the following cold weather may have killed the late-sprouting seed.

The spring-planted experimental plot of some thirty varieties of grasses and alfalfas didn't show any response until fall; but almost without exception, all varieties sprouted and started; but it is doubtful if many seedlings survived the frosty nights and dry days following the early fall rains.

Two hundred twenty-five acres of dry land was disced and seeded to desert wheat grass during the fall report period. This land had been previously placed in partial readiness for planting. Some of this land is of a submarginal type which supported a mixed stand of greasewood and sagebrush. A dry land type seeder was used which has been developed by the Squaw Butte Range Experiment Station at Burns, Oregon.

C. Collections and Receipts.

2. Specimens. To definitely establish a regional record, an American golden plover was taken on Malheur Lake on September 7 and turned over to the National Museum. Waterfowl were also taken on Malheur Lake for food habits analysis as previously recorded.

D. Control of Vegetation.

1. Summary of 1959 Spraying.

a. Plant Species Sprayed

False lupine (Thermopsis montana)
 Canada thistle (Cirsium arvense)
 Bull thistle (Cirsium lanceolatum)
 Willow (Salix sp.)

b. Growth Stage

False lupine - blooming
 Canada thistle - four inches to blooming
 Bull thistle - bud stage
 Willow - fully leafed

c. Treatment Dates

False lupine - June 3, 4, 7, 10, 11
 Canada thistle - June 17, 18, 23, 24; July 6, 7, 8
 Bull thistle - June 17, 18, 23
 Willow - July 1

d. Acres Sprayed

Canada thistle	19 acres
False lupine	12 acres
Bull thistle	2 acres
Willow	2 acres
Total:	35 acres

e. Chemical Control

False Lupine	2-4-D (ester) (3 qts./150 gal. H ₂ O)
Canada Thistle	amino triazole (8# dry/50 gal. H ₂ O)
Bull Thistle	amino triazole (8# dry/50 gal. H ₂ O)
Willow	2-4-D (amine) (20 gal./80 gal. H ₂ O) - wow!

f. Application Rates

Canada thistle	21#/acre of amino triazole
Bull thistle	21#/acre of amino triazole
False lupine	1#/acre of 2-4-D ester
*Willow	13#/acre of 2-4-D amine

*Mixture and application was made in error.

g. Cost(1) False Lupine

(a) Materials	\$13.00
(b) Labor	81.77
(c) Equipment Operation	6.25
Total:	\$101.02

(2) Canada Thistle

(a) Materials	\$624.20
(b) Labor	93.77
(c) Equipment Operation	7.75
Total:	\$725.72

(3) Bull Thistle

(a) Materials	\$91.20
(b) Labor	10.50
(c) Equipment Operation	1.25
Total:	\$102.95

(4) Willow

(a) Material	\$105.98
(b) Labor	17.11
(c) Equipment Operation	.75
Total:	\$123.84

h. Apparent Kill as Evident at the End of the Growing Season

- (1) False Lupine. An inspection of the area showed about an 80 per cent kill, but further deterioration probably takes place as the spray enters the root system.
- (2) Canada and Bull Thistle. Amino triazole gave a 95 per cent kill on the thistle. This can be considered excellent.
- (3) Willow. An apparent 100 per cent kill was evident; but owing to an error in both the mix and application, it will be another year before definite results can be

determined.

2. Kill from Previous Year's Spraying. Apparently, amino triazole gave a 100 per cent kill on Canada Thistle from the 1958 spraying. This is a costly spray, but well worth the money.

- F. Fires. Two reportable fires were experienced during the report period. One was a 2,240-acre marshland fire situated within two miles of the refuge headquarters which evidently started from smoking. The area burned was covered with a dense cover of tule growth accumulated over a period of years. Actually, the good derived from the fire more than offset the cost of suppression.

*control
burning
needed*

The second fire occurred on November 20, and, in the final analysis, was a very costly one. This fire started in a refuge-owned trailer house occupied by a dragline oiler, spread to an equipment shed, and from there to grass and marshland. The loss in property, equipment, and winter livestock feed was in excess of \$20,000. The estimated replaceable loss is over \$50,000 on today's market.

IV. RESOURCE MANAGEMENT

- A. Grazing. This was a year of short precipitation and irrigation water following the 1958 growing season which was one of low forage production as a result of intensive rodent population; and the combination didn't make 1959 a banner forage production season. That part of the Double-O Unit irrigated from springs reflected excellent production; and utilization on the portion of the refuge depending on Silver Creek for water was more productive than anticipated. A small carry-over of hay by most permittees will serve to augment the over-all usage from that Unit.

The Malheur Lake Unit will perhaps reflect an increased use over 1958 largely as a result of the early recession of the Malheur Lake water, which allowed for a much greater acreage to be utilized than the previous year.

Production in the Blitzen Valley was excellent in some fields, but short in most. Krumbo Valley, as a result of better water manipulation plus a 50-acre seeding of reed canary grass by permittee Witzel, reflected a definite increase in forage production. It was estimated that almost 4,000 AUM's use burned in the Buena Vista fire. Considering all contributing factors, the over-all use in the Blitzen Valley will be short of an average year.

In view of the above, it is interesting to note that our clerical department prepared 114 special use billings totalling \$89,676.20 during the period.

- B. Haying. All hay this year, as usual, has been disposed of on an AUM basis and none sold as hay.

- C. Fur Harvest. No muskrat trapping permits were issued this year due to the drastic decline in muskrat numbers. This can probably be attributed to the drying up of Malheur Lake and the reduction of feed.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report.

1. Waterfowl Banding. Banding operations were not as successful as was hoped, nor did we reach our quotas. A shortage of birds, the impossibility to obtain access to the main flocks, predation in traps, and heavy use of the bait by blackbirds all presented difficulties. Banded was a total of 445 pintails, 94 mallards, 2 American widgeon, 2 blue-winged or cinnamon teal, and 2 green-winged teal. A full report on this operation was made to the Regional Director by memorandum dated October 20.
2. Experimental Summer Grazing. The experimental grazing conducted in the southwest corner of Knox Field for the second year in a row produced definite results this period. Results on the heavy vegetation are shown pictorially in the photographic section. This experimental area was partially flooded during the period. Excellent waterfowl response was noted, including use by up to 2,000 Canada geese at one time. The experimental area in Knox Field and adjoining Knox Ponds carried 22 per cent of the swan, 36 per cent of the geese, 32 per cent of the duck, and 43 per cent of the coot use noted for the Blitzen Valley this period. *good*

VI. PUBLIC RELATIONS

- A. Recreational Uses. General public use of the refuge during 1959 showed an increase over 1958 even though the season of use was not so attractive. So much of the usually accessible scenic parts were dry and roads anything but good, no public hunting on the refuge waterfowl area, and upland game birds at a low ebb which reduced the perimeter hunting to a minimum, all were discouraging factors so far as refuge visitors were concerned. Registration at the museum reflected almost an 8 per cent increase over 1958 with the big part of the visitors on the area May 1 through August 31. The fall use of the refuge reflected the big change. At the museum, 880 registered during the last report period of 1958 compared with 311 during the same period in 1959. Part of this difference may be reflected in the visitors during the 50th Year Anniversary Program in 1958 and also the public hunting for waterfowl. It is estimated that approximately 11,000 visitor days were enjoyed on the refuge during 1959, 6 per cent of which were hunters, 22 per cent anglers, and 74 per cent miscellaneous. Of the miscellaneous number, it is estimated that 91 per cent were recreation visitors, 3 per cent official, 5 per cent economic use, and 1 per cent other.

Visitors from 29 states; Washington, D.C.; 6 provinces of Canada; and two foreign countries were represented in the museum registration.

B. Refuge Visitors. Those of special note and official visitors during the period were as follows:

September

- 5 O. L. Dickens, County Judge, Canyon City, Oregon
- 9 Fred A. Sankey, Mammal Control Supervisor, Baker, Oregon
- Ralph Ingles, Mammal Control Agent, Crane, Oregon
- Russell Zink, Mammal Control Agent, Fields, Oregon
- 19 Ray Glahn, Pilot-Biologist, Portland, Oregon
- 20-22 R. E. Griffith, Chief Division of Wildlife Region 1, Portland, Oregon
- Kenneth F. MacDonald, Regional Refuge Supervisor, Portland, Oregon
- 30 G. P. McClannahan, U. S. Forest Service (retired), Grants Pass, Oregon

October

- 7-8 Fred Kreller, U.S.G.M. Agent, Pendleton, Oregon
- 14 Ray Glahn, Pilot-Biologist, Portland, Oregon
- Winston Banko, Refuges, Washington, D.C.
- 14-16 Mr. & Mrs. Fred W. Trumbull, Sound Recording, Los Altos, California
- 16 Melvin Smith, District Agent, Portland, Oregon
- Eugene Nelson, Mammal Control Supervisor, Portland, Ore.
- 24 Mr. & Mrs. Wm. Forward, Ass't Mgr., Brigantine Refuge, N.J.
- 26 Mr. & Mrs. Chas. Annis, Office of Engineering, Portland, Ore.
- Ray Glahn, Pilot-Biologist, Portland, Oregon
- 27 Fred A. Sankey, Mammal Control Supervisor, Baker, Oregon
- 29 Senator Naterlin, Chairman of Senate Interim Committee of Natural Resources, Salem, Oregon
- Al Day, Director Oregon Fish Commission, Portland, Oregon

November

- 3 Fred Kreller, U.S.G.M. Agent, Pendleton, Oregon
- 6 Jas. Yoakum, B.L.M., Vale, Oregon
- 13 Ray Glahn, Pilot-Biologist, Portland, Oregon
- 17 Geo. Ducret, Cadastral Engineer, Portland, Oregon
- 17-18 Ralph Swisher, Regional Transport Driver, Tule Lake Refuge
- 18-19 Russell Zink, Predator Control, Crane, Oregon
- 23 Ray Glahn, Pilot-Biologist, Portland, Oregon
- 23-24 A. Vernon Ekedahl, Assistant Regional Refuge Supervisor, Portland, Oregon
- 26-28 Earl M. Irvine, Mechanic, Tule Lake Refuge, Tulelake, Calif.

- C. Refuge Participation. On October 13, the regular fall meeting of the B.L.M. local advisory board was attended by Refuge Manager Scharff.

Refuge Manager Scharff attended a meeting of the Harney County Chapter Izaak Walton League on October 21 where suggestions were formulated for presentation to the Interim Committee on Natural Resources scheduled for a meeting in Burns on October 29.

Refuge Manager Scharff attended the regular monthly meeting of the Harney County Chamber of Commerce on October 28.

On October 29, the State Natural Resources Senate Interim Committee meeting held in Burns was attended by Refuge Manager Scharff.

The annual Harney County Livestock Association meeting was attended by Refuge Manager Scharff in Burns.

A special Directors and Legislative Committee meeting of the Harney County Chamber of Commerce was attended by Refuge Manager Scharff on November 13.

From November 29 to December 2, Refuge Manager Scharff attended the Northwest Section meeting of the American Society of Range Management which was held in Kamloops, B.C. He drove to Portland where Biologists Watson Beed and Chas. Rouse were met and the balance of the trip was made together.

Biologist Marshall gave a slide talk on refuge activities and wildlife to 22 members of the Burns Library Club who held their monthly meeting at refuge headquarters on October 24.

Seven bird watchers from Burns were guided over the refuge by Biologist Marshall on October 31. Sixty species of bird were seen.

On November 9 and 10, Biologist Marshall visited the McKay Creek and Cold Springs Refuges. He gave a talk on Service activities to the Union County Chapter of the Izaak Walton League at La Grande on November 10. On November 11, before leaving La Grande, he showed slides of refuge operations before Dr. Charles Quaintance's class in Natural History at Eastern Oregon College and reviewed plans for the Ladd Marsh and Hot Lakes waterfowl areas with State personnel in the field.

The State Convention of the Izaak Walton League held in Eugene on November 27 and 28 was attended by Biologist Marshall who represented the Harney County Chapter at the meeting.

A B.L.M. Advisory Board meeting was attended by Biologist Marshall in Burns on December 10.

Monthly meetings of the Harney County Chapter of the Izaak

Walton League were attended by Biologist Marshall on November 18 and December 16. Mr. Marshall was elected chapter president for the coming year.

D. Hunting.

1. Archery Deer Area - September 19-20. Three hundred and forty-six hunters took 11 bucks, 20 does, and 22 fawn deer for a hunter success ratio of 15 per cent, which is good but considerably below the average for this area.

Heavy rains on the day prior to the opening and during the season made hunting conditions good. The fire hazard was reduced considerably, and no fires were reported.

All hunters reported getting some shooting and were, in general, well pleased with the season. Many lot deer were reported because of the extremely difficult tracking conditions, but most of the hunters tried hard to find their cripples which helped make the success ratio fairly high. It is believed that the deer population was below that of the previous year; however, more bucks were generally reported as being seen this year. It appears that many of the deer are getting educated and are leaving the area the first day of the season seeking safety in the surrounding rimrock.

In general, more violations of rules and regulations were committed this season than on previous years. The following is a summary of the violations seen:

- 3 boys shooting firecrackers from top of haystack.
- 2 hunters hunting in refuge without checking in at the station.
- 2 parties apprehended for driving vehicles on closed roads.
- 3 hunters were smoking in the field.
- 1 party camped in a prohibited area.
- 3 hunters shooting from State Highway while riding in the back of a truck.
- 1 party emptied garbage along refuge road.
- 2 deer were found that had been dressed out and not claimed. Hunters probably killed bigger deer or did not want to tag the small deer.
- 48 hunters failed to check out of the area as required.

Table 3 shows data on the archery area since its inception.

Table 3. Archery Area Statistics.

<u>Year</u>	<u>No. of Hunters</u>	<u>Bucks</u>	<u>Antlerless</u>	<u>Total</u>	<u>Success</u>
1956	135	19	14	33	24%
1957	265	15	41	56	21%
1958	275	14	47	61	22%
1959	346	11	42	53	15%

2. Malheur Waterfowl Hunting Season - 1959. The public shooting ground was not open this year. Due to the lack of water this year, only a very small portion of the shooting area had any water at all. Thus, with the lack of water and birds, it was deemed proper to close this area.

- E. Violations. In general, this was a year of few violations on and about the refuge, probably because of the closure of the public shooting area and the lack of birds, both upland and waterfowl.

However, there were more violations by archers this year than any previous year. Two hunters were cited for hunting with no permit, two hunters were cited for smoking in a prohibited area, and several warnings were issued for throwing debris from a vehicle and driving a vehicle in a prohibited area.

Fishing regulations violations on the refuge were few and far between this year. To our knowledge, no violations occurred at Krumbo Lake, and only a couple of over limits on the Blitzen River were known of, and these were hearsay by other fishermen.

There were several violations on deer killed on the refuge during the general deer season but the violators were not apprehended.

VII. OTHER ITEMS

- A. Items of Interest. On September 2, a Range Survey Seminar was attended in Burns by Refuge Manager Scharff which was of much value and interest to anyone connected with range management work. This survey, led by personnel of the Squaw Butte Range Experiment Station, was well attended by Bureau of Land Management, Forest Service, and Oregon State Game Commission employees and a goodly number of ranchers from over the entire County.

A demonstration of brush removal showing various types of equipment and hookups was held about a mile south of the refuge headquarters on October 14 by B.L.M. personnel and attended by several members of the refuge. Many interested ranchers were present as well as B.L.M. and State Extension personnel.

On November 17, an American 3/4-yard dragline was received by

regional transport from Bureau of Reclamation surplus. This looks like a good machine and while some repair and maintenance work will be required, we believe it to be an excellent acquisition to the refuge equipment list.

A meeting of interested individuals and organizations was attended in Burns, Oregon, on November 17 to discuss access and recreational possibilities in the Steens Mountain and similar areas administered by the Bureau of Land Management. This meeting was presided over by Director Ed. Woosley from Washington, D.C. An excellent turnout was had from all over the State of Oregon.

From December 4 to December 19, Refuge Manager Scharff spent in Providence Hospital where treatment was received for a muscular condition of the neck and right shoulder which had been aggravated by exposure and long hours spent on the Buena Vista fire.

A survey crew out of the Regional Engineers office in Portland headed by Jack Compton has been intermittently surveying on the refuge during this period, mostly doing cadastral work in establishing the new refuge boundary as a result of the last Public Land Order affecting the refuge and two of the more recent acquisitions.

During the period of September 21 to September 26, inclusive, Clerk-Typist Carey spent on the Sheldon Refuge assisting in bringing the clerical work up to date.

Assistant Refuge Manager Littlefield spent the period of October 25 through 26 returning the Harney County Display Booth which was exhibited at the Oregon Centennial in Portland to Burns where it will go on permanent display when the Burns museum is completed.

The Cagle's are the proud parents of a baby girl, Nancy Leanne, born October 20, 1959. Due to various personnel changes, youngsters residing on the refuge still total 19.

The Heath family was particularly hard hit by illness during the period with four out of eight members of the family being hospitalized for various reasons. The Cagle infant was also hospitalized during the period for a few days with a cold which it was feared could turn into pneumonia.

The Cagle family have had to change their diet somewhat lately. A bobcat was surprised by Warren Storm and Charles Cagle the morning of December 13 in Cagle's henhouse when they went to feed the chickens. Warren slammed the door and held it while Charles got his dad. Noel then dispatched the bobcat to the happy hunting grounds with a .22 rifle. The bobcat hated to go as he left behind 24 laying hens he had killed for his breakfast. The bobcat must have figured the Cagle's rooster was too tough to eat as he was spared. Anybody want to buy a good fighting rooster?

Paul G. DuMont's appointment was terminated on September 3. He left here on September 7 for a short vacation trip before entering Oregon State College where he plans to major in fish and game management.

Student Trainee Marvin R. Kaschke was furloughed on September 17 to return to college at Utah State for his senior year. Marvin proved to be outstanding in his position and it was with reluctance we saw him leave.

Colds and flu are quite prevalent this winter and few families on the refuge have escaped one of these illnesses completely.

Predators are still commonly seen on the area and are hungry. One coyote passed through the headquarters area between the refuge office and the flagpole, which are about 75 feet apart, intent only on looking for something to eat. It appeared that he had a mouthful of porcupine quills which gives some indication of their food shortage.

On Christmas night, a great horned owl executed himself while eating his Christmas dinner of duck on a transformer pole at headquarters. He somehow made contact with the hot line which contained 14,000 volts of electricity.

Composition credits for this narrative follow:

J. C. Scharff: Sections III A 1, 2, & 3; II B 4; III D 1; III F; IV A; VI A; VI B; 1st 7 paragraphs VI C; 1st 7 paragraphs VII A; VII C; Form NR 6.

David B. Marshall: Sections I B; II A, B, C, D, E, F, 1st paragraph G, & I; III C; V; last 6 paragraphs VI C; graphs depicting waterfowl use; photographs and their captions; NR Forms 1, 1-A, 2, 3, & 5.

Leon A. Littlefield, Jr.: Narration Section I A; Section II G except 1st paragraph; Section III A 4; III D except III D 1; IV B & C; VI D & E.

Noel L. Cagle: Cultivated Crop Section Form NR-6 & Form NR-8A.

Ivan J. Carey: Graph, NR Form, and photo caption typing; preparation and typing of cover and personnel roster.

Eugene P. Heath, Jr.: Proofreading, editing, and typing body of narrative report prepared by above-listed individuals; preparation and typing of weather table Section I A, last 8 paragraphs Section VII A; composition credits; table of contents.

- B. Photographs. Our photograph selection begins on Page 24 of this narrative report.
- C. Signature.

January 25, 1960
Report Completed

Approved Regional Office

J. C. Scharff - Refuge Manager



59-2BM-24. 10/2/59. Canada geese moving into and beginning morning feed on windrowed rye near Sod House Dam.

59-78-36. 11/2/59. Five trumpeter swans approaching Sod House Spring Pond.



59-2BW-25. 10/2/59. Canada geese and sandhill cranes feeding on rye near Sod House Dam. Buildings and trees in background are those of the Sod House Ranch brought in close to the birds since photo was taken with an 8 power lens.



59-64-16. 10/1/59. White-faced ibis, common egrets and a snowy egret feeding on fish concentrated in the drying waters of S-Curve Pond.



59-2BW-30. 10/2/59. Mallards diving for grain placed in 3 feet of water for trumpeter swans at Sod House Spring.



59-2BW-29. 10/2/59. Ross' Goose.



59-2BW-22. 10/1/59. Open water created in what was formerly dense marsh through two years of summer grazing in Knox Field. Ungrazed portion of field shows opposite fence.



59FP1-1. 10/13/59. Krumbo Dam and adjoining portion of Krumbo Lake from rim to south of dam.



59FP2-1. 11/18/59. Newly rebuilt bunkhouse at P-Ranch.



59FP2-2. 11/18/59. This porch was added to the P-Ranch house this period.



59FP3-4. 11/24/59. Buena Vista station after the fire. The destroyed building is in foreground. At the right end of it by the propane cylinder stood the trailer. The building which caught fire many times but which was saved shows center right. Meadows which caught fire show behind it. Building center left is Maintenanceman Currey's residence. Building Repairman Lull's residence and trees which caught fire are just out of picture on right.



59FP3-1. 11/24/59. Valuable equipment reduced to junk and concrete remained from storage shed fire.



59FP1-3. 11/12/59. Fire No. 2 burning in dry marsh growth on Malheur Lake. Unfortunately no pictures of the far more spectacular Buena Vista - Diamond fire were taken when it was in progress, as all hands were too busy fighting it.



59FP1-4. 11/12/59. Diggers constructing line around fire No. 2.



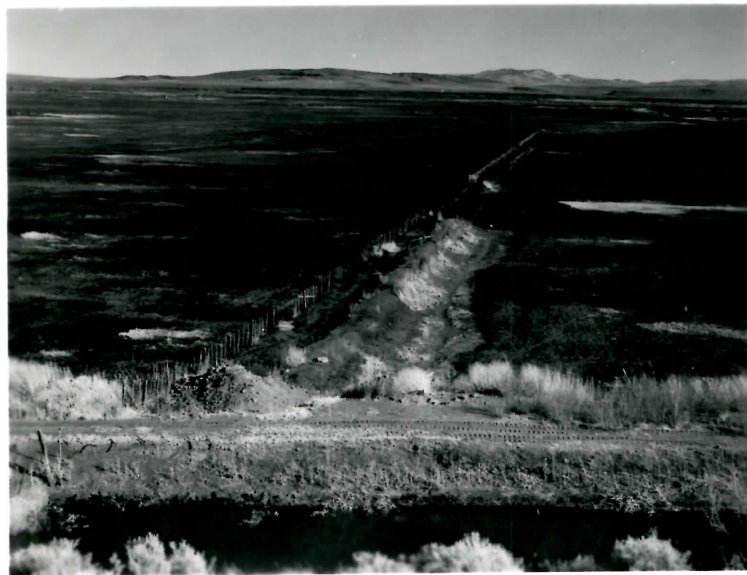
59FP2-11. 11/24/59. This is the type trailer in which fire 3 originated.



59FP2-12. 11/24/59. Remains of Ramelli Bridge across Blitzen River following fire.



59FP3-10. 11/24/59. This view looks east from hill above Currey residence. Note damaged fence, burned marsh and meadow as far as the eye can see.



59FP3-7. 11/24/59. A portion of Diamond Swamp along Jim Green Lane following the fire.